
MINOR ACTINIDE TRANSMUTATION-INCINERATION POTENTIAL STUDIES IN HIGH INTENSITY NEUTRON FLUXES.

Alain A. LETOURNEAU¹, Sébastien S. CHABOD¹, Yann Y. FOUCHER¹,
Frédéric F. MARIE¹, Danas D. RIDIKAS¹, Christian C. VEYSSIERE¹,
Christophe C. BLANDIN², Herbert H. FAUST³, Paolo P. MUTTI³,
Ilham I. ALMAHAMID⁴

¹ *CEA/Saclay - DSM/DAPNIA*

² *CEA/Cadarache - DEN/DER*

³ *Institut Laue-Langevin*

⁴ *Lawrence Berkeley National Laboratory*

An intensive program dedicated to the transmutation-incineration potential studies of Minor-Actinides in very intense neutron fluxes, namely the Mini-INCA project, has been initiated since few years at the French Atomic Agency (CEA). It deals with the development of new experimental techniques adapted for the very high neutron fluxes to measure the nuclear parameters of interest (capture and fission cross sections) as well as the transmutation and incineration potentials of actinides in a well characterised neutron flux.

For this purpose we have installed a calibrated alpha and gamma-spectroscopy station at the high flux reactor of ILL (Grenoble-France) allowing a quasi on-line measurement of the thermal neutron capture cross sections. In parallel, we are developing very small fission-chambers, namely micro fission-chambers, allowing a direct measurement of the thermal neutron-induced fission cross section and thus the incineration potential of the irradiated actinides. These fission-chambers are placed very closed from the fuel element allowing an access to a neutron intensity as high as $1.5 \cdot 10^{15}$ n/cm²/s with an epithermal component which does not exceed 15% of the total energy spectra. The advantages of these very high neutron fluxes is to get access to short-lived isotopes with low masses (few microgram) and thus low local perturbation of the flux.

The impressive recent results concerning the thermal neutron capture and neutron-induced fission cross sections and transmutation-incineration potentials of ^{241,243}Am, ^{239,242}Pu, ^{237,238}Np and ²³²Th, ²³³Pa will be presented and discussed. The analysis methods and recent developments concerning triple coupled micro fission-chambers will also be developed.